

Benefits of Regional Recycling Markets: An Alameda County Study

September 2003



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Section 1: Executive Summary

The Jobs Through Recycling Program (JTR) is designed to foster recycling market development by bringing the economic development and recycling communities together. JTR operates under the U.S. Environmental Protection Agency (U.S. EPA). Through the JTR program, the U.S. EPA supports projects to enhance business development, create jobs, increase waste diversion, provide financing assistance, and provide technical assistance for recycling-related industries. The JTR program goals are achieved by facilitating information exchange, providing networking opportunities, and offering grants to expand markets for recycled and reusable materials. The grants can also stimulate economic development and create jobs.

In 1998 the California Integrated Waste Management Board (CIWMB) launched a JTR program to establish regional recycling markets for locally generated waste, expand markets for recycled and reused materials, create jobs, and stimulate economic development. The CIWMB project was conducted in partnership with several other agencies. The goals were to divert more than 100,000 tons of materials per year, create at least 50 new jobs, and support \$7.5 million in capital outlay by the conclusion of the project. The project exceeded the JTR program goals.

1.1 Benefits Achieved

Environmental Benefits

- More than 140,000 tons per year are being diverted from the landfill.
- Air emissions and fuel consumption have been reduced by shortening transportation distances. Six of the nine businesses that sited as a result of this project primarily use materials recovered in Alameda County. Seven of the businesses use materials recovered from Alameda County and four adjacent counties.

Economic Benefits

- More than \$10 million in capital outlay provided improvement in infrastructure in the county. Examples of those improvements include added processing capacity in reclaimed wood, mattress recycling, improved relationships between recycling industries and generators, and computer software that facilitates computer reuse.
- Three of the businesses developed technological innovations that utilized new recycling techniques.
- Developed regional markets to reduce transportation cost.
- More than 100 jobs were created.
- Almost \$2 million in wages were generated and \$18,562,897 in secondary spending resulted from the project.

1.2 Project Scope

The CIWMB JTR 98 project was designed to accomplish the following:

1. Develop regional recycling markets by assisting recycling businesses to locate in close proximity to a large materials processing facility.

2. Reduce the region's reliance on out-of-state waste and foreign export markets.
3. Demonstrate the economic and environmental benefits derived from regional markets.
4. Increase diversion.
5. Increase jobs.
6. Promote capital formation.
7. Convert existing businesses to the use of recycled feedstock.

The CIWMB determined that Alameda County provided extraordinary opportunities to establish regional markets for recyclables. A majority of the recyclable materials recovered in Alameda County were being exported either to other states or to Pacific Rim countries. All the jurisdictions and major materials collectors providing diversion services within the county were actively pursuing ways to meet not only the State-mandated disposal reduction of 50 percent, but also the county's disposal reduction mandate of 75 percent by the year 2010. In anticipation of meeting those goals, Waste Management of Alameda County (WMAC) began the process of expanding its materials processing facility, the largest in the state, to increase primary and secondary processing of materials.

The Alameda County recycling community's interest in exploring alternative approaches to supporting businesses that divert materials served as the catalyst for this project. However, a number of other organizations were also exploring the feasibility of establishing an eco-industrial park to address the ongoing need for an industrial site for recycling businesses.

1.3 Regional Recycling Markets

Large processors, as well as small businesses, need specialized types and larger quantities of feedstock. This material is not sufficiently available through the two transfer stations or the Alameda County area. This is one of the most significant findings of the JTR project. Thus, a regional recycling market should be defined as a "wasteshed." The boundaries are based on factors such as types of materials available, type of recycling businesses, the recycling business size and processing capacity, and the volume of materials needed by the business, rather than by jurisdictional lines. Although most of the JTR-assisted businesses primarily receive feedstock from Alameda County, just about all businesses also depended on retailers, generators, and transfer stations located in neighboring San Francisco, Contra Costa, San Mateo, and Santa Clara counties.

1.4 Report Outline

This report documents the environmental and economic benefits of establishing regional recycling markets in Alameda County. As the scope of the project changed, the method of measuring these benefits was revised to accommodate the changes. The method for quantifying job creation, capital investment, and tons of materials diverted remained consistent throughout the project.

However, the JTR team was challenged to quantify the environmental benefits of reduced transportation fuel consumption, reduced transportation cost, and reduced vehicle emissions. The JTR project had hoped to demonstrate that a business could reduce its transportation cost, fuel consumption, and vehicle emissions by locating in close

proximity to its feedstock source (for example, the transfer station). However, this measurement proved to be elusive.

The origins of the Jobs Through Recycling Regional Marketing Project in Alameda County, its resources and its interest in supporting recycling business development, and testing concepts such as co-location of recycling business and eco-industrial park development are described in section 2 of this report.

An overview of the JTR team's activities and successful business recruitment strategies is provided in section 3.

The methodology and tools used to measure the JTR project's success—and define environmental and economic benefits—are provided in section 4. The environmental and economic indicators developed by the JTR team are also reviewed in section 4.

An overview of the businesses recruited by JTR includes schematics to illustrate material flow. The overview in section 5 provides criteria to discern patterns that will help define regional markets.

The environmental and economic benefits of establishing regional recycling markets in Alameda County are documented in section 6.

The JTR project findings are summarized in section 7.

Section 2: Origins of the Jobs Through Recycling Regional Marketing Project

This section provides background information on the CIWMB involvement in the JTR project, information about the project location in Alameda County, and the county's support of recycling business development.

2.1 *CIWMB Role*

The CIWMB Recycling Market Development Zone Program was created to foster markets for recovered recyclables to support the waste diversion activities that have been mandated in California's local jurisdictions. The curbside collection of recyclables from residences is the primary contact of most cities with the recycling industry. Faced with underdeveloped domestic recycling markets, California recycling industries are forced to rely heavily on foreign export markets. The lack of recycling-based manufacturing and processing infrastructure means that the higher paying recycling jobs are located outside the region.

Although most cities have an economic development program, they typically do not target recycling-based manufacturing. Public economic development agencies typically focus on housing, construction, retail, and high-tech sectors for development because these activities generate higher tax revenues. The recycling industry has special financing and permitting needs, and it requires a secure and specialized feedstock.

California jurisdictions can experience the economic and environmental benefits of recycling in their region by linking businesses that use recovered materials to make new products with local feedstock sources. In many of the studies of recycling market commodities, the cost of transportation was found to be a barrier to developing viable markets. A finished, high-value product can be transported economically, but it may cost more to ship a lower value resource than the material is worth to the manufacturer.

This project sought to test the hypothesis that recycled commodities would be more marketable if collected and used as a manufacturing feedstock within the region in which they were generated. To successfully establish regional recycling markets, it is essential for all of the stakeholders to work together to provide the most comprehensive set of services possible for the types of businesses to be sited. The project recruited businesses to the region, provided individualized technical assistance, and located businesses near the materials recovery facilities where the municipal recyclables are sorted and processed.

Job creation and infrastructure development were among the potential economic benefits a community would experience from establishing regional recycling markets. Resource conservation and emissions reduction were among the environmental benefits of attracting recycling businesses to a region. See section 6 for a full discussion of the environmental and economic benefits.

Members of the Alameda County recycling community expressed interest in testing the JTR concept of regional recycling market development. The Alameda County Waste Management Authority and the County's Source Reduction and Recycling Board have one of the most progressive and innovative recycling programs in the state. The county's geographic location, recycling policies and programs, financial resources, business

development resources, and interest in testing alternative approaches, made it a likely candidate to pilot the concept of regional recycling markets.

High real estate prices, the perception of recycling businesses as being dirty, the lack of access to low-income loans, and the complex process of obtaining permits were all identified as barriers to developing regional markets in Alameda County.

2.2 Project Location

Alameda County is located on the east side of the San Francisco Bay and encompasses a land area of 737.5 square miles. Most of the county's population is concentrated in the western part of the county between the East Bay Hills and the Bay, from Berkeley and Albany in the north to Fremont in the south. To the east is the greater Livermore Valley, which has been largely residential and suburban in character but is rapidly urbanizing.

Alameda County offers air, sea, and ground transportation access to the rest of the United States and the Pacific Basin. Alameda County has long been hailed as a transportation hub in the western U.S. because major rail and highway transit terminate at the East Bay after crossing the country. One of the nation's major containerized shipping facilities is located at the Port of Oakland. The port is an indispensable connection to international markets.

The county offers a well-developed system of higher education and research facilities, such as University of California at Berkeley, California State University at Hayward, a community college network, and several private colleges. Educational opportunities are available for businesses, individuals, and families with numerous public and private elementary and secondary educational institutions. Regional parks provide opportunities for a broad array of recreational activities.

The county is also host to Waste Management of Alameda County (WMAC), a subsidiary of Waste Management Inc. WMAC operates a 4.5-acre recycling park at its 53-acre transfer station on Davis Street in the City of San Leandro. WMAC was interested in transforming this facility into the most innovative and largest recycling park in the United States.

One of the most important factors in selecting Alameda County to host this project was that in 1990, Alameda County voters passed Measure D. This measure set an ambitious countywide mandate of 75 percent disposal reduction by 2010 and created the Alameda County Source Reduction and Recycling Board. Alameda County residents voted to tax the disposal of waste in landfills to support recycling and resource conservation programs.

Collectively, the authority and the recycling board operate as one organization, under the administrative direction of an executive director. The authority operates under a joint exercise of powers agreement for the County of Alameda, each of the 14 cities within the county, and the two sanitary districts that also provide refuse collection services. The governing body is comprised of 17 members who are elected officials appointed by each member agency.

Pursuant to California law, the authority is responsible for the preparation of Alameda County's integrated waste management plan and hazardous waste management plan. The authority provides support and assistance to its member agencies in the implementation of these plans. The authority and the recycling board also manage a long-range program

for development of solid waste facilities. They offer a wide variety of programs in waste reduction, market development, technical assistance, and public education.

Funding for the authority and the recycling board is derived from waste import mitigation fees and disposal fees at the Altamont, Vasco Road, and Tri-Cities landfill sites. The fees support funding assistance to public agencies, nonprofit organizations, private businesses, educational institutions, and other qualified parties. Generally, funding is available for innovative projects that promote source reduction, decrease the amount of waste disposed in Alameda County landfills, and encourage the development, marketing, and use of recycled-content products.¹

2.3 Alameda County Waste Management Authority Funding Assistance

The ACWMA operates a variety of programs that offer financial assistance to recycling-related businesses in the county. The three most significant are:

Market Development Assistance—The Market Development Assistance Program supports and funds business expansion and attraction efforts aimed at establishing or expanding value-added processing or end-use manufacturing facilities in Alameda County. Assistance in finding locations, feedstock sourcing, and market research is provided to technically viable projects. Grants are also provided to nonprofit organizations for innovative projects that increase involvement in recycling and decrease the amount of waste sent to landfills.

Revolving Loan Fund—The Revolving Loan Fund encourages businesses to reduce the amount of waste going to Alameda County landfills by providing low-interest loans for source reduction, recycling, composting, processing, or recycled market development efforts.

StopWa\$te Awards Program—The StopWa\$te Awards Program is a competitive program for Alameda County businesses and institutions that implement waste prevention projects. The awards are for waste prevention projects only, not for recycling or composting projects. The StopWa\$te Awards are designed to help divert materials that would otherwise be landfilled. The program offers monetary awards and technical assistance.

Section 3: JTR Business Recruitment and Assistance Strategy

This section provides an overview of the JTR project team's activities and successful business recruitment strategies.

3.1 The Project Team

The CIWMB established a broad public-private partnership to include a wide range of stakeholders in the project. This allowed the project team to provide comprehensive services to the recycling community. Establishing a diverse team facilitated meeting the core project goals and a number of business needs.

The JTR project team included the U.S. EPA, the CIWMB, the California Technology, Trade and Commerce Agency, three local public agencies: the Alameda County Waste Management Authority, the Oakland/Berkeley Recycling Market Development Zone, and the City of San Leandro; and four nonprofit organizations: Economic Development Alliance for Business (EDAB), the Community Environmental Council (CEC), Materials for the Future Foundation (MFF), and the Corporation for Manufacturing Excellence (Manex).

3.2 The Project Goals and Strategies

The CIWMB estimated that through the successful implementation of this project more than 100,000 tons of materials per year would be diverted, at least 50 new jobs would be established, and more than \$7.5 million in capital outlay would be provided.

The highest priority of the project team was information-sharing to facilitate business recruitment. Twice-monthly telephone conference calls and quarterly meetings provided an opportunity for the members to keep the team updated. Team members reported on property that was becoming available, existing businesses that expressed interest in expanding, and other issues related to siting new businesses. The quarterly meetings also provided opportunities for the team members to meet prospective recycling businesses and to hear presentations about their business and support needs.

To address feedstock availability concerns, the team reviewed waste characterization reports from the Davis Street Transfer Station (DSTS) and analyzed the quantities of materials being processed. Wood waste, construction and demolition materials, plastics, paper, tires, glass, and computers/electronics were designated as "priority materials."

The team focused on recruiting and assisting three types of businesses:

1. Existing recycling businesses that could increase use of recycled feedstock from Alameda County materials streams.
2. Businesses that could convert from primary to recycled feedstock.
3. New recycling businesses that would choose to locate in Alameda County.

To track project activity the partners created an intake form. The form identified specific needs for each business that was assisted, including the type of feedstock required and the type of product produced. The completed forms provided a means for the partners to

share information about businesses and to provide the appropriate assistance. A blank copy of the intake form is provided in Appendix A.

The JTR partners utilized a variety of methods for business recruitment. A direct mail campaign targeted industries in Alameda County. The mailer included a JTR brochure attached as Appendix B. The partners made follow-up phone calls to those businesses included in the direct mail campaign. They placed articles and advertisements in trade association newsletters, trade journals, and local newspapers.

The project team hosted a special workshop in San Leandro for existing recycling businesses interested in expanding and businesses interested in converting from primary to recycled-content feedstock. The workshop presented the project to new business prospects, and it brought together key local organizations and targeted businesses to accelerate their business decision-making processes. The 34 workshop attendees included 34 members of the JTR 98 project team.

Several team members assisted in trying to secure a 19.5-acre privately owned parcel located adjacent to the DSTS. While the project was in full operation, the boom in Internet (.com) companies in the San Francisco Bay Area drove up the cost of real estate and made it more difficult for recycling-based businesses to secure property. The property adjacent to the DSTS would provide much-needed industrial space for co-locating recycling businesses.

Section 4: Methodology

This section introduces the environmental and economic indicators developed by the JTR team and defines environmental and economic benefits. This section also reviews the methodology and tools used to measure the success of the JTR project.

4.1 Objectives

Following are the primary objectives of the JTR project:

1. Develop regional recycling markets by assisting recycling businesses to locate in close proximity to the DSTS.
2. Reduce reliance on out-of-region export markets.
3. Demonstrate the economic and environmental benefits derived from regional recycling markets.

4.2 Environmental and Economic Indicators

The project team established the following market indicators to measure success in achieving the project objectives:

Environmental Indicators

- Increased diversion of materials.
- Reduced traffic congestion.
- Reduced air emissions.
- Reduced fuel consumption.
- Toxins diverted from landfills.
- Reduced dependence on exports markets.

Economic Indicators

- Investment in regional recycling infrastructure.
- Reduced transportation cost.
- Jobs created from new and/or expanding recycling manufacturing businesses.
- Investment in new recycling manufacturing technology.
- Increased dollars spent locally (multiplier effect) from JTR 98 project recycling manufacturing and/or processing.
- Employment training programs.
- Value added to materials by the processor or manufacturer.
- Avoided cost of landfilling materials.

4.3 Discussion of Indicators

The purpose of this report is to document the environmental and economic benefits of establishing regional recycling markets in Alameda County. The JTR project team made several assumptions about regional markets at the onset of this project.

These assumptions included the following:

1. The DSTS could serve as the primary source of feedstock for the businesses recruited to the region.
2. The regional recycling market boundaries could be defined as the cities in Alameda County that fed into the DSTS.
3. Locating businesses near the DSTS would reduce dependence on out-of-state and foreign exports of recycled materials.

However, the original assumptions regarding regional recycling markets were challenged, and as businesses were recruited and sited, the scope of the project evolved to meet the needs of the recycling businesses. The first change occurred in the early stage of the project when the JTR team expanded the scope of the project to include materials intercepted from waste generators prior to entering the DSTS. Existing Alameda County recycling-based businesses (who were considering expanding their operations) and several businesses that were considering moving to Alameda County expressed interest in a broader range of materials and more specialized feedstock than those available from the DSTS. Some recycling businesses expressed interest in recovering materials directly from large waste generators, retailers, and other transfer stations.

In order to accommodate the needs of the businesses, the Berkeley Transfer Station was added to the recommended source of feedstock. The project materials sources continued to broaden as large recycling businesses and small nonprofit businesses expressed a need for specialized types of feedstock and larger quantities of feedstock than that which were available through either transfer station.

The need for the recycling businesses to recover materials from transfer stations, retailers, and generators from throughout the nine-county San Francisco Bay Area demonstrated that regional recycling markets cross jurisdictional lines to serve a “wasteshed.” Wasteshed boundaries are based on factors such as types of materials available, the type of recycling businesses, the size of the recycling businesses, the volume of materials needed, and specialized materials required. Additionally, most business models suggest that larger businesses diversify so that they are not dependent on only one source, in case there is a supply interruption.

Although the method for quantifying the economic benefits of job creation, capital investment, and tons of materials diverted remained consistent throughout the project, the JTR team was challenged to quantify the environmental benefits of regional markets. Most of the JTR-assisted businesses primarily received feedstock from Alameda County. However, businesses also relied on retailers, generators, and transfer stations located in the neighboring counties of San Francisco, Contra Costa, Marin, Santa Cruz, and Santa Clara for feedstock materials. Quantifying environmental and economic benefits proved to be difficult while the definition of “regional recycling markets” evolved during the course of the project.

- **Reduced air emissions**

The JTR partners attempted to apply the U.S. EPA Model Part 5 computer software to determine the environmental impact of a fleet of vehicles. However, this software requires information on types of vehicles, types of fuels, road conditions, miles traveled, and maintenance history. The JTR-assisted business fleets were typically comprised of five or less vehicles, which is too small a sample for the software to perform a meaningful analysis. The businesses were also unable to provide detailed and accurate information regarding the number of trips and frequency of the trips required by the U.S. EPA model.

Further, the JTR-assisted businesses considered information about their vendors and customers to be proprietary. They were reluctant to answer the detailed questionnaire that would have allowed the JTR project to evaluate the transportation systems more thoroughly.

- **Reduced fuel consumption from vehicles**

Locating a business in close proximity to the feedstock (for example, near the transfer station) should reduce the distance driven before the recovered materials were used in the manufacture of a new product. This would reduce the quantity of fuel consumed and hence the quantity of vehicular air emissions produced. However, as the definition of the “regional market” changed and the project area expanded, greater distances had to be traveled. It is assumed that using materials within the county still reduces the total distance traveled and hence reduces the total vehicle emissions.

- **Reduced transportation cost**

Over half of the JTR-assisted businesses represent unique business models in the project area, and these business types exist in very few areas in the nation. No transportation model is available to show the cost savings of locating in the recycling region.

Seven of the nine JTR-assisted businesses are small businesses with less than 20 employees, and they are diverting less than 10,000 tons per year. Four of the nine businesses continued to import or export materials from out of state or out of the county. These businesses are filling a niche market that suggests that economic and environmental benefits are realized when recycling businesses have close-in feedstock and easy-to-identify local markets. These factors translate into savings on transportation; however, the savings are difficult to quantify without comparison to other business models.

- **Investment in regional recycling infrastructure**

A focus of the JTR project was to provide the technical and financing assistance that would overcome some of the gaps in recycling infrastructure. However, the gaps are so severe that an investment in recovered materials infrastructure could constitute just about any aspect of business development. This includes, but is not limited to, processing facilities; manufacturing facilities; transportation; communication networks between the waste handler, recycler, and the manufacturer; education of the public; and changes in the legal system that licenses, develops, and supports performance specifications for products with recycled content or used parts. For the purpose of this project, infrastructure investments were quantified through capital outlay.

- **Employment training programs**

One of the JTR project goals was to demonstrate the potential training opportunities for low-income communities by locating recycling businesses in or near those communities. For the purpose of this project, the value of the employment training programs was to be determined by the number of training positions offered by each business and the total number of training opportunities provided by the aggregate of JTR businesses. None of the JTR-assisted businesses used formal employment training programs. Six of the nine businesses indicated that they do provide transitional employment opportunities for individuals who are new to the workforce or re-entering the workforce after an extended absence due to a disability, chemical addiction, or personal hardship. However, these businesses refrained from suggesting that entry-level positions were actually formal training programs.

- **Value added**

Value added is defined as the increase in value of material as it progresses through the manufacturing process. The JTR-assisted businesses represent diverse industries and different stages of processing within each industry. Many of these businesses start with a feedstock that has no market value. If the waste recovered by the business had no monetary value as an input, then the JTR team assigned an added value to the product of 100 percent.

- **Reduced reliance on out-of-state and foreign exports**

Two of the businesses, Community Woodworks (CW) and Ersch Recycled Millworks (ERM), reduced reliance on out-of-state and foreign export of recovered wood. Lumber reclaimed by CW and ERM had previously been exported to Chile and other Latin American markets. Comparing the vehicle air emissions and fuel consumption of CW or ERM with their counterparts that ship the product overseas was not feasible.

Cargo shipping may be more environmentally damaging than other mobile sources. But emissions generated by a truck making multiple trips and carrying a half ton of used lumber may be just as damaging as a cargo ship carrying that same load to a foreign country. The JTR project did not have the resources to quantitatively demonstrate otherwise.

Recent studies have proven that air emissions from trade-carrying cargo ships powered by diesel engines are among the world's highest polluting combustion sources per ton of fuel consumed.² Based on calculations used to obtain a conservative figure on total emission from shipping, "worldwide ship nitrogen emissions are equal to nearly half of the total emissions from the United States, 42 percent of nitrogen emissions from North America, 74 percent of emissions from the Organization for Economic Cooperation and Development Europe and 190 percent of those from Germany."

Seventy to eighty percent of all cargo ships burn dirty residual fuels, rather than higher-grade distillate oils. Since the 1973 fuel crisis, crude oils have been processed using secondary refining technologies to extract the maximum quantities of refined distillate products. As a consequence, the concentration of contaminants such as sulfur, ash, asphaltenes, and metals in the residuals has increased.³

Therefore, although the emissions from cargo shipping most likely cause more environmental damage than local trips in a vehicle, the JTR team is not able to substantiate such a claim.

4.4 *Environmental Benefit Evaluation Tools*

Software tools that evaluate environmental impacts are rapidly evolving and setting new standards for quantifying environmental impacts. As the concept of regional recycling markets continues to evolve, these computational tools may become useful to future projects.

Computer modeling has focused on three concepts: industrial ecology, eco-industrial park development, and life cycle assessment. Industrial ecology is an interdisciplinary framework for designing and operating industrial systems that mimic systems found in nature. Eco-industrial park development models are designed to determine how to optimize the environmental performance of existing manufacturing businesses.

This is done by minimizing the waste output of the business and by developing a model for eco-efficiency from co-location of facilities that exchange waste and share infrastructure systems and power. Life cycle assessment focuses on quantifying the environmental burden of a product, process, or activity in terms of the entire cycle. The assessment examines the extraction of resources through use to recycling or disposal. Future projects may be able to use life cycle analysis to determine the environmental and economic performance of a specific recycled-content product in a given region.

At this time, these analytical tools do not emphasize modeling factors such as job creation, resource conservation (materials diverted from the landfill), reduced dependence on exports, or reduced distances traveled. Due to the lack of existing models with which to compare JTR businesses, diagrams used to represent the movement of materials—from generator to recycling processor to end-user—proved to be a useful tool in discussing and analyzing the flow of materials.

4.5 *Defining a Regional Recycling Market*

Developing a clear definition of regional recycling market is key to evaluating the economic and environmental benefits of the region. The JTR project developed a basic line of questioning to demonstrate the challenges of defining regional markets and to discern patterns that will help to define characteristics of regional markets in the future.

In this regard, a matrix was developed to help identify the general source of JTR feedstock. Initially, five questions were asked to test the assumptions regarding regional markets.

The five questions asked initially were:

1. Does the new or expanded business reduce reliance on the export market by performing a processing or manufacturing activity that eliminates the need to ship the feedstock overseas or to another state?
2. Does the business receive the largest portion of its feedstock from Davis Street Transfer Station?
3. Does the business receive the largest portion of its feedstock from the Berkeley Transfer Station?
4. Does the business receive the largest portion of its total feedstock from within Alameda County?
5. Does the business receive more than 50 percent of its feedstock from within Alameda County? Businesses may receive the largest single portion of their feedstock from

Alameda County and still receive more than 50 percent of the feedstock from other California counties or from outside of the state.

However, since none of the JTR-assisted businesses primarily received materials from either the Davis Street Transfer Station or the Berkeley Transfer Station, the region was enlarged to cover all of Alameda County, and the questions relating to feedstock from the two transfer stations were dropped from the survey analysis.

For each question, a “yes” answer is represented by a 1; and a “no” answer is represented by a 0. The cumulative scores help us draw general conclusions about the correlation between the size of a business, its feedstock needs, and geographic distribution of its feedstock.

Table 4.1. Regional Recycling Scoring Matrix

Economic and Environmental Benefits	1 = yes 0 = no
Does the business:	
a. Reduce reliance on exports?	
b. Receive feedstock primarily from Alameda County?	
c. Receive more than 50% of feedstock from Alameda County?	
Total score	(maximum 3)

These criteria have been applied to each of the JTR assisted businesses. The details of this survey are provided in section 5 of this report.

Section 5: JTR Project Businesses

This section provides an overview of the businesses recruited by JTR. Each entry includes a description of the business, a JTR project business summary, a diagram illustrating the materials flow, and the regional recycling matrix. The business summary provides details on the JTR project goal measurements. It lists the products manufactured, the percent value added, the total tons diverted, the total capital outlay, the number of jobs created, the total annual wages, and the projected financial impact to the community.

5.1 ***Community Woodworks***

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Oakland Army Base, Building 823
Oakland, CA 94607
Tel: (510) 835-7690
Fax: (510) 835-7691
www.communitywoodworks.org

Community Woodworks (CW) is the first Bay Area lumber mill to specialize in remanufacturing wood reclaimed through deconstruction (the process in which building materials are salvaged through careful dismantling). CW is a nonprofit organization that was founded by a coalition of community organizations seeking ways to support deconstruction and wood reuse as a means of creating jobs and providing employment training in economically disadvantaged communities.

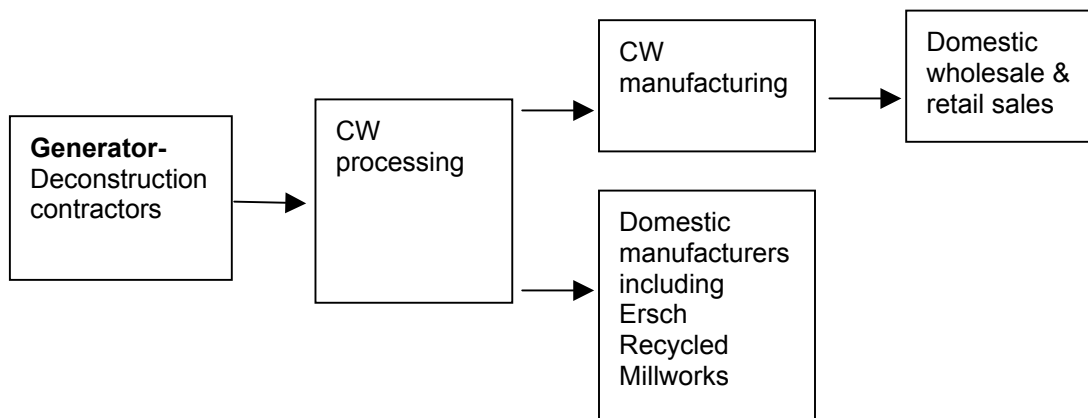
The business was started in 1998 with a \$500,000 grant from the federal Department of Health and Human Services, Job Opportunities for Low Income Individuals program. Additional funding was obtained from the William and Flora Hewlett Foundation; U.S. EPA Region 9; and the Alameda County Waste Management Authority.

CW's feedstock comes from lumber salvaged through deconstruction at the Oakland Army Base and from deconstruction companies throughout the San Francisco Bay Area. CW purchases "raw" salvaged wood from deconstruction enterprises, removes nails, sorts the lumber, and re-mills it into custom, high-quality reclaimed wood products that are made available to designers, builders, furniture makers, homeowners, architects, and artists. Their end products include molding, flooring and paneling.

In March 2000, the JTR project assisted CW in securing a lease on a warehouse at the former Oakland Army Base in West Oakland. The Alameda Waste Management Authority provided \$42,573 towards rent payments. In addition, the authority provided support for an accounting firm to review the CW business plan and projections.

Table 5.1.1. Community Woodworks Business Summary

Product type	Re-milled wood, siding, and architectural products
Value added	50%
Tons diverted	214
Total capital outlay	\$1,179,218
Jobs created	5
Total annual wages	\$116,400
Funds circulated in community	\$2,099,008
Investment in technology	No

Figure 5.1. Community Woodworks Materials Flow Diagram**Table 5.1.2. Community Woodworks Regional Recycling Markets Matrix**

Economic and Environmental Benefits		Discussion
Does the business:	1 = yes 0 = no	
a. Reduce reliance on exports?	1	If CW did not exist, the deconstructed materials would be transported to Davis Street Transfer station and ground into mulch or it would be shipped to overseas markets.
b. Receive feedstock primarily from Alameda County?	1	CW receives approximately 60% of its feedstock from Alameda County.
c. Receive more than 50 percent of its feedstock from Alameda County?	1	CW receives approximately 25% of its feedstock from San Francisco and 15% from Sonoma County.
Total Score	3	

5.2 Ersch Recycled Millworks

c/o Community Woodworks
2420 Ukraine Street
Oakland Army Base, Building 823
Oakland CA 94607
Tel: (510) 435-3773

Ersch Recycled Millworks (ERM) is a sole proprietorship run by its founder and owner, Eron Ersch. Ersch, a licensed general contractor, specializes in manufacturing interior and exterior doors. Ersch operates a 400-square foot cabinet wood workshop in Berkeley where he produces cabinets, doors, and specialized architectural replicas that support his general contracting business.

In July 2000 the JTR project provided Ersch with \$3,300 to work with two nonprofit organizations, Community Woodworks and the Depot for Creative Reuse, to determine the feasibility of using reclaimed wood to make doors and tables. Ersch successfully manufactured prototype doors from reclaimed wood and moved his operation to the Oakland Army Base to expand. Ersch co-located with CW and utilized the sorted, de-metalled recycled wood that had been re-milled by CW. ERM also worked with the Depot for Creative Reuse and CW to provide training opportunities for their employees on an informal basis.

ERM originally planned to sell their products at the Depot for Creative Reuse retail store; however, direct sales to contractors and homeowners throughout Northern California proved to be more profitable. Tables manufactured by ERM made from reclaimed wood sell for \$300 or more. ERM has since converted from primary lumber to reclaimed lumber for the manufacture of several other products. Ersch employs two part-time employees at the CW site on an as-needed basis.

Table 5.2.1. Ersch Recycled Millworks Business Summary

Product type	Doors, cabinets, shelves from reclaimed wood
Value added	500%
Tons diverted	1.5
Total capital outlay	\$73,600
Jobs created	1
Total annual wages	\$45,600
Funds circulated in community	\$131,008
Investment in technology	No

Figure 5.2. Ersch Recycled Millworks Materials Flow Diagram

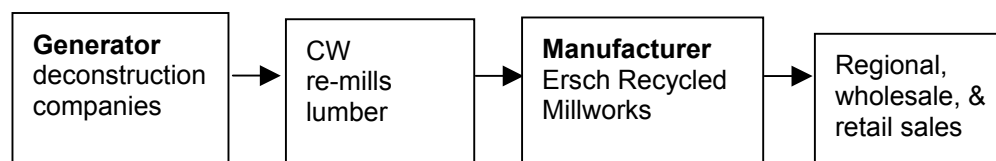


Table 5.2.2. ERM Regional Recycling Market Matrix

Economic and Environmental Benefits		Discussion
Does the business:	1 = yes 0 = no	
a. Reduce reliance on exports?	1	ERM is supplied by CW, which does not export materials.
b. Receive feedstock primarily from Alameda County?	1	ERM receives all of its feedstock from CW, its sole supplier for recovered materials. CW is located in Alameda County.
c. Receive more than 50 percent of its feedstock from Alameda County?	1	ERM is the only JTR assisted business that does not receive any feedstock from outside of the county.
Total Score	3	

5.3 *Protect All Life Foundation*

2201 Wake Avenue
Oakland CA, 94607
Tel: (510) 834-8257
www.recycletrees.org

The Protect All Life (PAL) Foundation is a nonprofit organization started in 1995 by two neighbors, Marcus von Skepsegardh and Shane Eagleton. PAL salvages trees that are being removed from urban areas and parks. PAL mills the trees into lumber or uses the trees to create large sculptures, healing poles, decking, flooring, and furniture.

PAL collects wood from Alameda County parks and the Davis Street Transfer Station. Redwood, cypress, pine, and elm wood is milled at the 1.5-acre Oakland facility and sold to contractors and homeowners throughout Northern California.

Table 5.3.1. Protect All Life Business Summary

Product type	Flooring, decking, paneling, original art from fallen trees.
Value added	100%
Tons diverted	500
Total capital outlay	\$500,000
Jobs created	2
Total annual wages	\$100,000
Funds circulated in community	\$890,000
Investment in technology	No

Figure 5.3. PAL Materials Flow Diagram

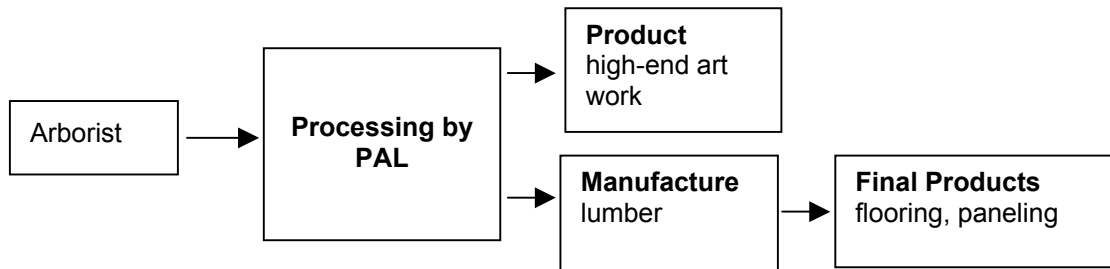


Table 5.3.2. PAL Regional Recycling Market Matrix

Economic and Environmental Benefits		Discussion
Does the business:	1 = yes 0 = no	
a. Reduce reliance on exports?	0	There is no export market for fallen trees.
b. Receive feedstock primarily from Alameda County?	1	60% of feedstock comes from Alameda County; PAL receives a limited amount of wood from the Davis Street Transfer Station (approximately 5%).
c. Receive more than 50 percent of its feedstock from Alameda County?	1	30% feedstock comes from San Francisco. 10% feedstock comes from other counties.
Total Score	2	

5.4 The Reuse People

2615 Davis St.
San Leandro, CA 94577
Tel: (858) 254-1880

The Reuse People (RP) operates a building materials resale yard located on the Davis Street Transfer Station property. The Reuse People is a nonprofit organization that was started in San Diego in 1994 and began operating in Alameda County in 1999. Approximately 5 percent of the materials sold come from the Davis Street materials recycling facility; 10 percent, from drop-off; 15 percent, from contractors; and 70 percent, from building deconstruction projects performed by the Reuse People.

Building materials sold at the site include lumber, bicycles, bricks, cabinets, cinder blocks, clay roofing tiles, fixtures, windows, doors, and other building materials. Apartment owners and small contractors are among the biggest customers at the building materials yard.

Approximately 12 percent of the materials handled are sold at the deconstruction job sites; 48 percent are sold at the resale yard; and the remaining 40 percent are exported.

Most of the small dimensional lumber is exported to Mexico. Windows and doors are also shipped to foreign markets.

The Reuse People has received \$202,000 in grants from the ACWMA, and the organization pays below market-rate rent to WMAC.

Table 5.4.1. Reuse People Business Summary

Product type	Building materials reuse
Value added	N/A
Tons diverted	5,100
Total capital outlay	\$1,552,000
Jobs created	20
Total annual wages	\$450,000
Funds circulated in community	\$2,762,560
Investment in technology	No

Figure 5.4. Reuse People Materials Flow Diagram

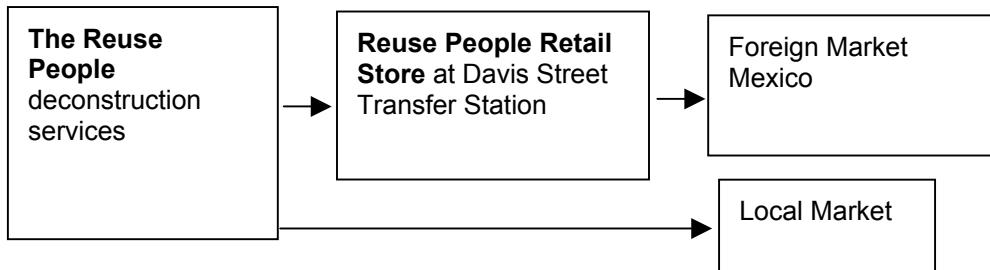


Table 5.4.2. Reuse People Regional Recycling Market Matrix

Economic and Environmental Benefits		Discussion
Does the business:	1 = yes 0 = no	
a. Reduce reliance on exports?	0	Estimated 40% is exported.
b. Receive feedstock primarily from Alameda County?	1	Approximately 70% of the materials are generated from deconstruction jobs in Alameda County, which includes the 5% recovered from Davis Street.
c. Receive more than 50 percent of its feedstock from Alameda County?	1	30% of materials come from other counties.
Total Score	2	

5.5 Bay Area Tire Recycling

Davis Street Transfer Station
2615 Davis Street
San Leandro, CA 94577
Tel: (510) 562-4300

Bay Area Tire Recycling (BATR) is Northern California's first tire recycling and crumb rubber manufacturing facility. BATR operates a 2,700-square foot facility on a 0.75-acre parcel at Waste Management's Davis Street Transfer Station. The facility is capable of processing passenger and light truck tires at the rate of more than 3,000 pounds per hour. The resulting ground rubber product is used to manufacture a wide range of consumer, commercial, industrial, and farm products. These include mats, fence posts, and playground and safety equipment. The crumb rubber is sold throughout California and Arizona.

BATR receives less than 20 percent of its feedstock from the Davis Street Transfer facility. However, BATR receives more than 50 percent of its materials from Alameda County. BATR will have the capacity to process 600,000 passenger and light truck tires per year into "steel-free" ground rubber products. ACWMA provided a total of \$442,380 in financial assistance to BATR over a four-year period.

Table 5.5.1. BATR Business Summary

Product type	Crumb rubber
Value added	250%
Tons diverted	500
Total capital outlay	\$4 million
Jobs created	17
Total annual wages	\$480,000
Funds circulated in community	\$7,120,000
Investment in technology	Yes

Figure 5.5. BATR Materials Flow Diagram

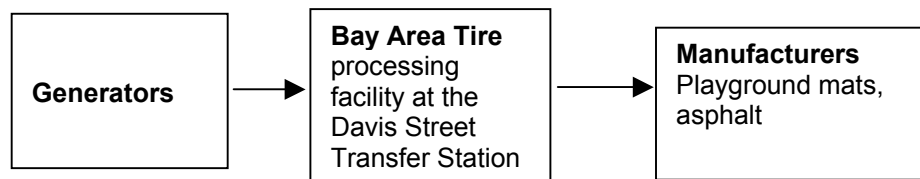


Table 5.5.2. BATR Regional Recycling Market Matrix

Economic and Environmental Benefits		Discussion
Does the business:	1 = yes 0 = no	
a. Reduce reliance on exports?	0	There is no export market for tires.
b. Receive feedstock primarily from Alameda County?	1	Approximately 60% of tires are recovered from Alameda County; approximately 20% of the tires are from Davis Street.
c. Receive more than 50 percent of its feedstock from Alameda County?	1	BATR collects 40% of the tires from throughout the Bay Area.
Total Score	2	

5.6 Alameda County Computer Resource Center

5725 International, Bldg. D
Oakland, CA 94621
Tel: (510) 434-1325
www.accrc.org

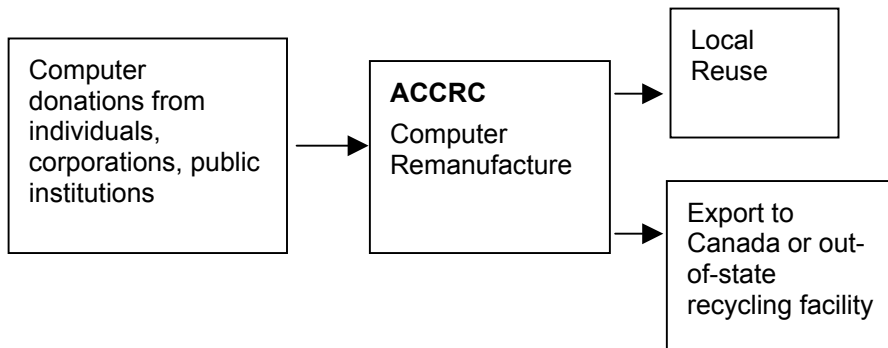
The Alameda County Computer Resource Center (ACCRC) is a nonprofit organization that collects computer equipment from businesses throughout the Bay Area and refurbishes computers donated by businesses and individuals. ACCRC was founded in 1993 in the garage of executive director James Burgett. ACCRC provides hands-on technical training to disadvantaged individuals. ACCRC distributes 30 to 50 refurbished Pentium-level computers per week to local nonprofit organizations, schools, libraries, economically disadvantaged individuals, and developing countries.

Some of the computers refurbished at the ACCRC facility are shipped for use to Latvia, Cuba, Cambodia and Africa. ACCRC has discontinued shipping computers to China for recycling due to recent reports on hazards to human health and the environment caused by mishandling computer waste in that country. ACCRC now charges a recycling fee to accept the electronic equipment. The recycling fees are \$10 per monitor, \$15–30 for a television, and \$5 for each printer, scanner, fax machine, office machine, VCR, stereo equipment, and camera. The fees cover the cost of shipping non-refurbishable equipment to smelters located in Canada and the Midwestern U.S. ACCRC estimates that 40 percent of the computer equipment comes from within Alameda County.

To reduce the cost of purchasing new software and to avoid software-licensing violations, ACCRC has successfully developed a free alternative computer operating system. The operating system is based on Linux open-source software and is designed to work on older model computers. Other ACCRC innovations include a “Beowulf” supercomputer built from refurbished computers, and a machine that allows ACCRC to erase old 3.5-inch floppy disks and reformat them for reuse.

Table 5.6.1. ACCRC Business Summary

Product type	Computer reuse
Value added	N/A—products are donated, not sold
Tons diverted	8,320
Total capital outlay	\$2,223,700
Jobs created	13
Total annual wages	\$380,444
Funds circulated in community	\$3,958,321
Investment in technology	Yes

Figure 5.6. ACCRC Materials Flow Diagram**Table 5.6.2. ACCRC Recycling Matrix**

Economic and Environmental Benefits		Discussion
Does the business:	1 = yes 0 = no	
a. Reduce reliance on exports?	0	ACCRC currently exports non-refurbishable equipment to smelters in Canada or Missouri.
b. Receive feedstock primarily from Alameda County?	0	ACCRC recovers an estimated 40% of its equipment from residential drop-off and corporations located in Alameda County.
c. Receive more than 50 percent of its feedstock from Alameda County?	0	60% of the materials are recovered from public agencies and corporations outside of Alameda County.
Total Score	0	

5.7 St. Vincent de Paul

705 S. Seneca (headquarters)
Eugene, OR 97402
Tel: (541) 687-5820

The St. Vincent de Paul Society (SVDP) operates a full-service mattress recycling center in Oakland. The 10,000-square foot facility recovers polyurethane foam, steel, cotton, and wood. The facility collects mattresses from residential households, mattress companies, thrift stores, the Davis Street Transfer Station, and Sunset Scavenger recycling company in San Francisco. St. Vincent de Paul also works with mattress manufacturers. St. Vincent de Paul has an agreement with McRoskey Airflex Mattress Company, located in San Francisco, to receive mattresses from their customer “take-back” program, as well as excess trim and other manufacturing by-products. St. Vincent de Paul charges an average of \$4 per mattress for pickup.

The facility has reclaimed approximately 274.4 tons of steel, 59.7 tons of polyurethane foam, 132.67 tons of cotton fiber, and 33.17 tons of ticking per year. Eighty percent of the recovered foam and steel is sold to recyclers in Alameda County, and the remaining 20 percent is sold to buyers in Texas. The wood is currently used for compost or alternative daily cover at the landfill. St. Vincent De Paul is currently looking for a buyer for $\frac{3}{4}$ x 2-inch boards of various lengths.

Table 5.7.1. St. Vincent de Paul Business Summary

Product type	Mattresses
Value added	100%
Tons diverted	820.25
Total capital outlay	\$900,000
Jobs created	10
Total annual wages	\$198,160
Funds circulated in community	\$1,602,000
Investment in technology	No

Figure 5.7 St. Vincent de Paul Materials Flow Diagram

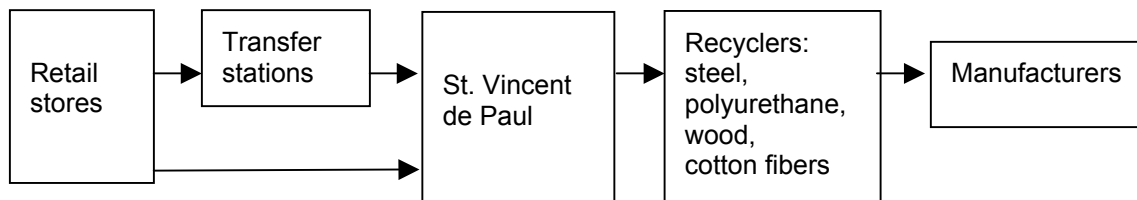


Table 5.7.2 St. Vincent de Paul Regional Recycling Matrix

Economic and Environmental Benefits		Discussion
Does the business:	1 = yes 0 = no	
a. Reduce reliance on exports?	0	Mattresses do not have an export market.
b. Receive feedstock primarily from Alameda County?	1	Approximately 30% of feedstock is generated in Alameda County; 10% from out-of-area sources; some feedstock from Davis Street, other transfer stations, and thrift stores.
c. Receive more than 50 percent of its feedstock from Alameda County?	0	60% of the feedstock is generated from San Francisco, Contra Costa, and Santa Cruz Counties.
Total Score	1	

5.8 Container Recycling Alliance

33333 Western Avenue
Union City, CA 94587
Tel: (510) 791-6980

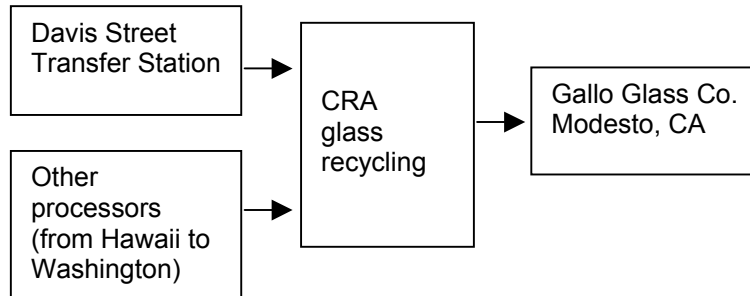
Container Recycling Alliance (CRA) is a state-of-the-art glass recycling facility owned by Waste Management's Recycle America. The facility provides a steady source of high-quality, recycled glass for Gallo Glass Company, a subsidiary of E & J Gallo Winery.

The facility features a fully automated glass sorting line that removes foreign material (including ceramic and metal) from three-mix glass, a combination of clear, brown, and green recycled glass. The facility has the capacity to process 160,000 tons of three-mix glass annually at approximately 25 tons per hour.

CRA is the second largest glass processor in the United States and one of the largest users of high-tech automated equipment for processing glass. CRA receives only a small fraction of its total glass supply from the Davis Street Transfer Station, but the company receives all of the mixed glass processed at the DSTS. CRA receives glass cullet from as far away as Hawaii and Washington State.

Table 5.8.1. CRA Business Summary

Product type	Manufacture furnace-ready cullet
Value added	N/A
Tons diverted	60,000
Total capital outlay	N/A
Jobs created	25
Total annual wages	N/A
Funds circulated in community	N/A
Investment in technology	Yes

Figure 5.8. CRA Materials Flow Diagram**Table 5.8.2. CRA Regional Recycling Matrix**

Economic and Environmental Benefits		Discussion
Does the business:	1 = yes 0 = no	
a. Reduce reliance on exports?	0	The glass was not previously exported.
b. Receive feedstock primarily from Alameda County?	0	Davis Street provides a substantial amount of feedstock to CRA; however, Davis only supplies a small fraction of the total CRA feedstock required. Feedstock is received from throughout the western United States from as far away as Hawaii and Washington.
c. Receive more than 50 percent of its feedstock from Alameda County?	0	
Total Score	0	

5.9 Specialty Crushing

100 Webster Street, Suite 104
Oakland, CA 94607
Tel: (510) 986-0964

Specialty Crushing (SC) diverts more than 1 million tons of cement and rock per year from construction and demolition sites throughout the state. Baserock and aggregate are produced at Specialty Crushing's six cement-crushing sites and three portable crushers that are taken to demolition sites. Although Specialty Crushing operates throughout the state, most of its customers are located in Alameda County, San Francisco, Sacramento, Fairfield, and Pleasanton. SC employs seven people at its Oakland location.

In May 2000, Specialty Crushing obtained a site in Oakland that allowed it to divert an additional 65,000 tons of rock, the majority of which comes from Alameda County, and most of the rest from Western Contra Costa County.

Table 5.9.1. Specialty Crushing Business Summary

Product type	Base rock, aggregate.
Value added	100%
Tons diverted	65,000
Total capital outlay	N/A
Jobs created	7
Total annual wages	\$228,480
Funds circulated in community	N/A
Investment in technology	No

Figure 5.9. Specialty Crushing Materials Flow Diagram

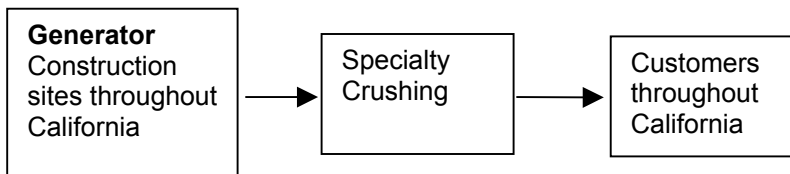


Table 5.9.2. Specialty Crushing Recycling Matrix

Economic and Environmental Benefits		Discussion
Does the business:	1 = yes 0 = no	
a. Reduce reliance on exports?	0	Cement doesn't have an export market.
b. Receive feedstock primarily from Alameda County?	1	The Oakland plant receives the majority of its materials from western Alameda County.
c. Receive more than 50 percent of its feedstock from Alameda County?	1	The Oakland plant receives the majority of its materials from western Alameda County.
Total Score	2	

5.10 Regional Recycling Market Summary

Table 5.10.1 provides a summary of the regional recycling market matrices for the JTR-assisted businesses.

Table 5.10. Cumulative Scores for Regional Recycling Businesses

Business	a. Reduces reliance on out-of-state and foreign export?	b. Receives feedstock primarily from Alameda County?	c. Receives more than 50 percent of its feedstock from Alameda County?	Total
CW	1	1	1	3
ERM	1	1	1	3
PAL	0	1	1	2
RP	0	1	1	2
BATR	0	1	1	2
ACCRC	0	0	0	0
SVDP	0	1	0	1
CRA	0	0	0	0
SC	0	1	1	2
Total	2	7	6	15

5.11 Summary of Regional Recycling Market Business Patterns

(a) Reduces reliance on out-of-state and foreign exports

Although reducing reliance on out-of-state and foreign exports was a primary goal of the JTR project, only Community Woodworks reduced reliance on out-of-state or foreign exports. The ACCRC and the Reuse People, which are the two midsize businesses (between 5,000–8,500 tons per year), continued to utilize out-of-state or foreign export markets.

The ACCRC continues to depend on out-of-state and foreign markets to process cathode ray tubes from televisions and computer monitors. This is also due to the lack of local processing capacity. However, ACCRC indicated that if it added a glass-crushing machine to its operation, it would most likely import glass from Nevada and possibly other neighboring states. This would reduce reliance on exports for processing, but the leaded glass would continue to be shipped out-of-state for reuse.

The feedstock recovery patterns of JTR-assisted businesses suggest that larger recycling businesses require larger geographic areas from which to recover feedstock. The CRA model suggests that placing a large processing facility in a region reduces reliance on out-of-state and foreign exports, but increases reliance on out-of-state imports.

(b) Receives feedstock primarily from Alameda County

Seven of the nine businesses primarily receive materials from Alameda County. The ACCRC and CRA do not receive the majority of their feedstock from Alameda County. This suggests that the larger businesses require feedstock from a larger geographic area. Specialty Crushing, the largest among the businesses, recovers materials from throughout California. CRA, the second-largest business in the project, imports materials from as far away as Hawaii and Washington. This suggests that regional recycling markets are defined by a business's size, processing capacity, and watershed, rather than jurisdictional boundaries.

The Davis Street Transfer Station is unable to provide the quantity or the specialized feedstock required by the businesses.

Lack of quantity:

- Although CRA utilizes almost all of the glass from Davis Street that meets CRA specifications, Davis Street is still only able to provide CRA a fraction (less than 10 percent) of the total quantity of feedstock required by CRA.
- St. Vincent de Paul recovers materials from the San Francisco, Berkeley, and Davis Street transfer stations, retail outlets, and manufacturers.
- Although BATR is located at the Davis Street Transfer Station, the facility is unable to fully supply BATR with tires.
- PAL is able to recover limited amounts of wood from the Berkeley and Davis Street transfer stations; however, the majority of its feedstock comes directly from parks and arborists.

Unable to supply specialized feedstock:

- CW and ERM require specific species and dimensions of wood that are typically not available from the Davis Street Transfer Station.

Possible competitor:

- ACCRC is a possible competitor to Waste Management's Recycle America electronic recycling business.

PAL and St. Vincent de Paul indicated that they receive feedstock from the Berkeley Street Transfer Station. Expanding the JTR project to include the Berkeley Street Transfer Station still did not provide sufficient feedstock to meet the needs of the businesses.

(c) Receives more than 50 percent of its feedstock from Alameda County

Four of the nine JTR-assisted businesses received more than 50 percent of their feedstock from outside of Alameda County. Generally, these are the larger businesses, and they include CRA, SVDP, BATR, and ACCRC. Larger businesses need to acquire their feedstock from multiple sources to ensure a continuous supply.

The Reuse People, which employs 20 people and diverted approximately 5,100 tons (the third-largest business in terms of employees and fourth in tonnage), is located at the Davis Street Transfer Station. The business was able to secure several large deconstruction contracts in Alameda County.

The four smaller businesses were able to sustain their operations with feedstock primarily from Alameda County.

Two of the nine businesses received three of three possible points on the regional recycling market survey. Four other businesses received two points, one received one point, and two did not receive any points. None of the JTR-assisted businesses received feedstock primarily from either the Davis Street or Berkeley transfer stations. This reflects the immature state of the regional market.

The smaller businesses were all able to get their feedstock from within the county. Six of the businesses went straight to the generator for their feedstock and did not seek materials processed at a transfer station. This suggests that businesses may need specialized collections.

To the extent that the materials utilized by the JTR-assisted businesses would have otherwise passed through one of the transfer stations on the way to being disposed, the project accomplished its goal of reducing materials landfilled. In time, and as the regional market matures, businesses may develop processes that can use materials aggregated at the transfer stations.

Section 6: Environmental and Economic Benefits Summary

6.1 Benefits of Regional Recycling Markets for Alameda County

The JTR Project accomplished its implementation goals. One hundred jobs were created, contributing approximately \$1,999,084 in additional wages to the local economy of Alameda County. More than 140,000 tons of material per year is being diverted. More than \$10 million in capital outlay was invested, and \$18,562,897 is circulating in Alameda and adjacent counties. Table 6.1 provides a comparison of the project goals and achievements. Table 6.2 summarizes the economic benefits of the project.

Table 6.1. Comparison of Project Goals and Achievements

Benefits	Projected	Achieved
Jobs created	50	100
Capital outlay	\$7,500,000	\$10,428,518
Tons diverted	100,000	140,456

Table 6.2. Economic Benefits Identified by the JTR Project

Business Name	Jobs Created	Annual Wages	Total Capital Outlay	Public Financing	Increased Spending As a Result of Initial Investment
CW	5	\$116,400	\$1,179,218	\$549,323	\$2,099,008
ERM	1	\$45,600	\$73,600	\$3,300	\$131,008
PAL	2	\$100,000	\$500,000	\$100,105	\$890,000
RP	20	\$450,000	\$1,552,000	\$202,000	\$2,762,560
BATR	17	\$480,000	\$4,000,000	\$442,380	\$7,120,000
ACCRC	13	\$380,444	\$2,223,700	\$190,000	\$3,958,321
SVDP	10	\$198,160	\$900,000	\$242,500	\$1,602,000
CRA	25	N/A	N/A	N/A	N/A
SC	7	\$228,480	N/A	N/A	N/A
Total	100	\$1,999,084	\$10,428,518	\$1,729,608	\$18,562,897

6.2 *Local Economic Impacts*

In addition to the initial money spent locally, there is a larger impact on the local economy, called the “multiplier principle” from these recycling and processing activities. The multiplier principle builds on the concept that an induced increase in consumption, investment, or government expenditures leads to additional income and consumption spending by secondary parties. This expands total spending by a larger amount than the initial increase in expenditures.

Based on data from the U.S. Department of Commerce, the JTR project used a multiplier of 1.78 to determine additional spending by secondary parties as a result of the JTR project’s capital outlay. The 1.78 multiplier is based on the average saving rate in the U.S. of 1.6 percent⁴ and the average tax rate of 29 percent.

6.3 *Tons of Materials Diverted*

The majority of the 140,000 tons of materials diverted had been destined for Alameda County landfills. Eight of the nine businesses also recovered materials from outside the county. The counties of San Francisco, Santa Cruz, Sonoma, San Mateo, Marin, Santa Clara, and Contra Costa also benefited from the JTR project. CRA receives materials from as far away as Hawaii and Washington.

6.4 *Value Added*

Value added is defined as the increase in value of material as it progresses through the manufacturing process. The JTR-assisted businesses represent diverse industries and different stages of processing within each industry. Many of these businesses use feedstock for which there is no market value; therefore, determining the percentage of value added is difficult. Feedstock for which there was no original market value was assigned an increased value of 100 percent.

6.5 *Investment in New Recycling Manufacturing Technology*

The JTR project considered two types of technology investments: (1) invention, or the use of science and engineering to discover new products or processes; (2) innovation, the practical and effective adoption of new techniques.

Invention typically requires a significant investment and time. However, innovation is more frequently applied from “off-the-shelf technology.” However, both types of technology investments are important and a higher dollar amount does not represent a higher contribution to improving recycling systems. Three of the businesses utilized off-the-shelf technology improvements in their operations.

Table 6.3. Value Added, Diversion, and Technology Investment

Business	Product type(s)	Value added to product (%)	Total tons diverted	Technology investment
CW	Lumber	50%	214	
ERM	High-end doors and tables	500%	2	
PAL	Flooring, decking, original art	100%	500	
RP	Building materials	N/A*	5,100	
BATR	Crumb rubber	250%	500	Yes
ACCRC	Electronics	N/A*	8,320	Yes
SVDP	Mattresses	100%	820	
CRA	Glass cullet	N/A*	60,000	Yes
SC	Base rock, aggregate	100%	65,000	
Total			140,456	

* N/A: not applicable, products not sold.

6.6 *Priority Materials*

At the outset of this project, wood waste, construction and demolition materials, plastics, paper, tires, glass, and computers/electronics were designated priority materials. CW, ERM, PAL, RP, and SVDP all divert some of the wood waste generated in the county. PAL, RP, and SC divert construction and demolition materials. BATR diverts tires, CRA diverts glass, and ACCRC diverts computers/electronics.

Section 7: Conclusion

7.1 *JTR Project Goals*

The essential interests of the JTR project included the following:

- a) Develop regional recycling markets by assisting recycling businesses to locate in close proximity to a large materials processing facility.
- b) Reduce the region's reliance on out-of-state waste and foreign export markets.
- c) Demonstrate the economic and environmental benefits derived from regional markets.
- d) Increase diversion.
- e) Increase jobs.
- f) Promote capital formation.
- g) Convert existing businesses to the use of recycled feedstock.

Two general conclusions emerged from the JTR regional recycling market project.

7.2 *The JTR Business Recruitment Model Is Successful*

The JTR project determined that providing technical assistance, financial resources, and consistent feedstock within a region would create economic and environmental benefits in that region as well as in adjacent communities. The recruitment tools developed by the JTR project were highly successful in meeting the economic and environmental goals of materials diversion, job creation, and capital outlay. As a result of JTR business recruitment efforts, 100 jobs were created; 9 businesses were started or expanded; more than \$10 million in total capital outlay was provided; and 2 businesses, Community Woodworks and Ersch Recycled Millworks, reduced reliance on out-of-state and foreign exports of recycled feedstock. However, no existing businesses converted to using recycled feedstock during the course of this project.

Environmental benefits

- More than 140,000 tons are being diverted from the landfill annually.
- Shortened transportation distances have reduced air emissions and fuel consumption, since seven of the nine businesses primarily use materials recovered in Alameda County and four adjacent counties.

Economic benefits

- More than \$10 million in capital outlay provided improvement in infrastructure in the county. Examples of those improvements include added processing capacity in reclaimed wood and mattress recycling, improved relationships between recycling industries and generators, and developing computer software that facilitates computer reuse.
- Three of the businesses developed new, innovative recycling techniques.

- The JTR project assisted businesses in developing regional markets to reduce transportation cost.
- One hundred jobs were created.
- Almost \$2 million in wages was generated and \$18,562,897 in secondary spending resulted from the project.

7.3 *Regional Recycling Markets Cross Jurisdictional Lines*

The original assumption that the establishment of regional recycling markets would best be accomplished by drawing from one or two materials recovery facilities proved to be too narrow in scope. This report demonstrates that regional recycling markets cross jurisdictional lines to serve a “wasteshed.” Boundaries are based on factors such as types of materials available, type of recycling businesses, the business size, volume of materials needed, transportation routes, and the need for specialized materials.

Recycling businesses require feedstock from multiple sources and from multiple jurisdictions, depending on the size and processing capacity of the business. Therefore future regional recycling market development efforts should consider defining regions according to the wasteshed of the region. These regions should be defined according to the size and processing capacity of those businesses the market development team determines most feasible to target.

The findings in this report suggest that the following alternative definitions for regional recycling markets should be considered and explored in more detail.

- **Jurisdictional benefits**—A jurisdiction can benefit economically from recruiting businesses to locate within its boundaries. The benefits include the investment of capital, job creation, wages paid, and the economic multiplier effects of the business.

If the jurisdiction wants to collect and use feedstock generated within the jurisdiction, it should create a profile of the business size, type, and the recycling capacity that can be supported within the wasteshed of the jurisdiction. As the tonnage required by the businesses increases, the geographical region from which the business recovers feedstock must also increase. Larger businesses ultimately must depend on materials from other counties or imports from other states. These businesses may need to export their end-products out of state or to foreign countries.
- **Business size and processing capacity**—When defining a regional recycling market, one size does not fit all businesses. If a recycling market development team from a specific jurisdiction or agency targets large recycling processors, that team should consider defining the recycling region according to the wasteshed. The team should work with intercounty, interstate, or international stakeholders to develop efficient recovery and transportation systems. The JTR findings suggest that the larger the business, the larger the geographical area required to supply its feedstock. The two largest businesses assisted by JTR imported materials from throughout California and the western United States.
- **Targeting generators in a regional wasteshed**—The project findings suggest that transfer stations do not have the specialized types of feedstock or the quantity of feedstock to supply large businesses or extremely small businesses. Therefore, recycling market development teams should focus on identifying the quantity and type of materials available from a variety of generators such as public and private

institutions, businesses, retail outlets, and industry transfer stations. Transportation and fuel consumption savings will most likely be realized by developing efficient collection systems from those generators.

7.4 Next Steps

Product stewardship

Nationally, product stewardship models are being tested for carpet, electronics, and battery products. Product stewardship encourages manufacturers to share the responsibility for end-of-life management of their products. Under a product stewardship model, recyclers typically collect the materials from the generator, retail outlet, or other alternative, convenient location. Transfer stations rarely play a large role in collection.

Waste Management, Inc., is a leader in developing new collection strategies for some of these targeted wastes. Waste Management's Recycle America program is currently working with electronic manufacturers to develop alternative methods for both recovering and financing the recycling systems for electronics products.

Regional approach

Progressive counties such as Alameda can leverage resources and jointly invest in small, as well as large, recycling businesses that clearly benefit several jurisdictions. Transportation cost savings and fuel consumption are realized when emerging recycling businesses take advantage of a niche market in a region. Unique business models will spring up and their success will depend on that region's ability to provide technical assistance and identify consistent sources of locally generated feedstock.

Appendix A: JTR Intake Form

JTR-98 Business Intake Form		
A. Business Contact Information		
<i>Primary need from JTR 98:</i>	<i>Contact Date:</i>	<i>JTR 98 Contact Person:</i>
<i>Business Name:</i>	<i>Contact Person Name:</i>	<i>Job Title:</i>
<i>Address:</i>	<i>City:</i>	<i>State (or County) & Zip Code:</i>
<i>Telephone:</i> ()	<i>FAX:</i> ()	<i>Internet Address:</i>
B. Technical		
<i>Business Plan:</i> <input type="checkbox"/> complete <input type="checkbox"/> partial <input type="checkbox"/> none <i>Current Business Status:</i> <input type="checkbox"/> start up <input type="checkbox"/> pilot/demo <input type="checkbox"/> existing <input type="checkbox"/> licensing, expansion <i>Barriers (Technical, Market):</i>	<i>Primary Business Type:</i> <input type="checkbox"/> manufacturing <input type="checkbox"/> collection <input type="checkbox"/> processing <input type="checkbox"/> transformation <input type="checkbox"/> service <input type="checkbox"/> retail <input type="checkbox"/> re-manufacturing other: SIC Code: # RMDZ (name):	<i>Product Produced:</i> <i>Recycled Content in Product:</i> <i>Value added to materials:</i> <i>Market for Product:</i> <i>Product Testing Performed/Required:</i>
C. Employment		
<i>Number of Jobs:</i> Created _____ Retained _____	<i>Average wage (all staff):</i> Management staff \$ _____/year non-mgmt. staff \$ _____/year	<input type="checkbox"/> MBE <input type="checkbox"/> DBE <input type="checkbox"/> WBE
D. Materials (Targeted and Diverted)		
<i>Feedstock(s):</i> <i>Feedstock Substitution Potential:</i>	<i>Tons Per Year:</i> <i>Start-up:</i> <i>Capacity:</i> <i>%Utilization (now):</i>	<i>Source of Material(s):</i>
E. Financial Considerations		
<i>Financing Methods:</i> <input type="checkbox"/> debt <input type="checkbox"/> equity <input type="checkbox"/> grants <input type="checkbox"/> loans <i>Business-to-business sales tax</i> <i>Generated \$ _/year</i>	<i>Project Cost:</i> <i>Land & Buildings: \$</i> <i>Equipment Cost: \$</i> <i>Equity in Project: \$</i> <i>Equity Source:</i>	<i>Project Financing needed:</i> \$ _____ <i>Public funding needed:</i> \$ _/year, for _____ years
F. Siting Issues		
<i>Size of parcel needed: _ acres</i> <i>Size of building: _ sq. ft.</i>	<i>Infrastructure needs (utilities, etc):</i> <i>Special building requirements</i> <i>(height, doors, etc.) :</i>	<i>Special needs (permits, insurance):</i> <i>Co-location benefits:</i>

Appendix B: JTR Brochure

Alameda County Recycling Marketplace

***Welcoming Recycling
Businesses to the
East San Francisco Bay Area***



The Smart Place for Sustainable Business

The Alameda County Recycling Marketplace
Centralized Referrals c/o



**8800 Cal Center Drive, MS-31
Sacramento, CA 95826**

Printed on recycled paper

Your Marketplace Partners

- **Alameda County Waste Management Authority & Recycling Board (ACWMA):**

Countywide recycling and source reduction technical assistance to improve business environmental performance, public education, market development programs, grants, loans, and financial awards for waste reduction projects, and a potential source of funds to help establish businesses.

- **California Integrated Waste Management Board (CIWMB):**

Technical experts, low-interest loan program for companies sited in the Recycling Market Development Zone (RMDZ), project grant administration, and lead agency on the project's marketing plan.

- **California Trade & Commerce Agency (CTCA):**

The State's lead agency for promoting economic development, job creation, and business retention in California. The Manufacturing Technology Program supports projects and programs that help to improve the competitive edge of smaller manufacturers.

- **City of San Leandro:** Proposed infrastructure improvements and potential assistance to facilitate the siting of related recycling industries in close proximity to the Davis Street recycling facility.

- **Community Environmental Council (CEC):**

Close working relationship with the Davis Street recycling facility, knowledge of the material flows and business development opportunities, extensive experience in providing hands-on assistance, business planning, market research and site identification. CEC also has strong links to the leasing, redevelopment, and material sourcing opportunities on closed military bases in the Bay Area.

- **The Corporation for Manufacturing Excellence (Manex):**

Technical and business solutions designed to help small and mid-sized manufacturers, aimed at increasing profitability, strengthening market position, and developing a skilled workforce.

- **Economic Development Alliance for Business (EDAB):**

Regional economic development partnership between public, private, and nonprofit sectors to improve economic viability of the East Bay. Supports sustainable development, seeking balanced approach to environmental protection, business development, and social equity.

- **Materials for the Future Foundation (MFF):**

Comprehensive enterprise development services to nonprofits and community based entrepreneurs with expertise in start-ups. MFF specializes in providing financial assistance through loans and grants and financing referral information, as well as information on recycling business opportunities.

- **Oakland/Berkeley Recycling Market**

Development Zone (RMDZ): Expedited permitting and referral of qualified job applicants, low-interest loans, site location assistance, and employment training.

- **United States Environmental Protection Agency (US EPA):**

Through state partners nationally, EPA's Jobs Through Recycling program aims to stimulate recycling market development by bringing together the economic development and recycling communities through grants, networking, and information sharing.

- **Waste Management of Alameda County, Inc. (WM):**

Provider of significant, consistent quality feedstock for a number of materials processed at its Davis Street recycling facility, the major materials stream for this project.



For more information, including economic and city profiles, feedstock analysis, and to talk to someone on how to get started exploring The Alameda County Marketplace, contact

The Alameda County Recycling Marketplace Project (916) 255-1000

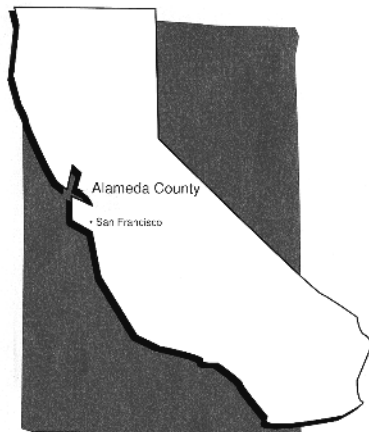
The Marketplace is made possible by a US EPA Jobs Through Recycling (JTR) grant and a matching grant from the California Trade & Commerce Agency, administered through the California Integrated Waste Management Board.

www.ciwmb.ca.gov/marketplace/
E-mail: mktplace@ciwmb.ca.gov

Alameda County

Recycling Marketplace is a public-private partnership linking businesses that use recycled materials with the necessary expertise to enter local markets.

Alameda County, located in the East San Francisco Bay Area, is an ideal location for companies that process or



manufacture goods from recycled materials. California law requires every city and county to reduce, by 50 percent, the amount of materials it sends to landfills. In Alameda County, the voters went a step beyond State law by approving an initiative that requires a 75 percent waste diversion rate, targeted for the year 2010.

Together, these state and local mandates assure a favorable economic and political climate, along with the feedstocks necessary, to expand regional markets for recyclable materials.

The Marketplace partners are eager to work with you to build your business and develop local markets for recycled materials.

City and County Facts

Alameda County, with a population of 1.4 million (1999), generates 2.7 million tons of waste annually and has a 42 percent diversion rate (1997).

Berkeley, Oakland, and San Leandro are the key partner cities in the Alameda County Recycling Marketplace project.

Target Materials

- Paper
- Construction and Demolition Debris
- Wood
- Painted Wood
- Asphalt Shingles
- Wallboard
- Carpet and Textiles
- Computer and Electronics Discards
- Plastics
- Tires
- Glass

Benefits of the Marketplace

- Lower transportation costs and the competitive advantage of central access to local and international markets, located in a major hub.
- Access to low-interest loans, grants, and training funds.
- Access to a diverse labor pool, from entry-level trainees to highly educated technicians.
- Direct access to a steady supply of local recycled feedstock, both traditional and nontraditional, available from multiple sources.
- Assistance in developing business plans and product marketing.
- Manufacturing and technology research and assistance.
- Siting assistance.
- Expedited permit processing.
- Partnership opportunities with existing recycling-based businesses and operations.
- Cooperative business environment.

Notes

¹ Alameda County Waste Management Authority, Source Reduction and Recycling Board <<http://www.stopwaste.org/fssearch.html>>.

² James J. Corbett and Paul Fischbeck, “Emissions from Ships,” *Science*, October 31, 1997, pp. 823–824.

³ “International standard, Petroleum Products Fuels (class F)—Specifications of Marine Fuels,” International Organization for Standardization, Geneva, Switzerland, 1987.

⁴ U.S. Department of Commerce Survey of Current Businesses, National Income and Product Account Tables, 2001 <www.bea.gov/bea/pubs.htm - subject>.